Sertifikaat / *Certificate*

REPUBLIC OF SOUTH AFRICA

REPUBLIEK VAN SUID-AFRIKA

PATENT KANTOOR
DEPARTEMENT VAN HANDEL EN NYWERHEID

PATENT OFFICE
DEPARTMENT OF TRADE AND INDUSTRY

Hiermee word gesertifiseer dat
This is to certify that

the documents attached hereto are true copies of the Forms P2, P6, provisional specification and drawings of South African Patent Application No. 2003/5822 in the name of Rollerbrake (Proprietary) Limited

Filed : 29 July 2003

Entitled : Conveyor Idler with Locking Device

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Geteken te **PRETORIA** in die Republiek van Suid-Afrika, hierdie 16th dag van **January 2004**

Signed at in the Republic of South Africa, this day of

Register of Patents

REPUBLIC OF SOUTH AFRICA | REGISTER OF PATENTS | PATENTS ACT, 1978

OFFICIAL APPLICATION	LODGING DATE: PROVISIONAL	ACCEPTANCE DATE
21 01 2003/5322	22 29 JUL 2003	47
INTERNATIONAL CLASSIFICATION	**LODGING DATE: COMPLETE**	**GRANTED DATE**
51	23	

FULL NAME(S) OF APPLICANT(S)/PATENTEE(S)

71 ROLLERBRAKE (PROPRIETARY) LIMITED

APPLICANTS SUBSTITUTED: | **DATE REGISTERED**

71

ASSIGNEE(S) | **DATE REGISTERED**

71

FULL NAME(S) OF INVENTOR(S)

72 BOGDANOVIC, BOGDAN

PRIORITY CLAIMED	COUNTRY	NUMBER	DATE
N.B. Use International abbreviation for country (see Schedule 4)	33 NIL	31 NIL	32 NIL

TITLE OF INVENTION

54 CONVEYOR IDLER WITH LOCKING DEVICE

ADDRESS OF APPLICANT(S)/PATENTEE(S)

BROADACRES HOME & GARDEN CENTRE, CRAIGAVON HOUSE, 1ST FLOOR, OFFICE 4B, RANDBURG, 2194, GAUTENG, SOUTH AFRICA

ADDRESS FOR SERVICE | **S & F REF**

74 SPOOR & FISHER, SANDTON | PA135687/P

PATENT OF ADDITION NO.	DATE OF ANY CHANGE
61	
FRESH APPLICATION BASED ON	**DATE OF ANY CHANGE**

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978

REVENUE FORM P.1

R 006000

HARR 711

APPLICATION FOR A PATENT
AND ACKNOWLEDGEMENT OF RECEIPT
(Section 30 (1) – Regulation 22)

The granting of a patent is hereby requested by the undermentioned applicant on the basis of the present application filed in duplicate

OFFICIAL APPLICATION NO.		S & F REFERENCE
21	01 • • 2003/5822	PA135687/P

	FULL NAME(S) OF APPLICANT(S)
71	ROLLERBRAKE (PROPRIETARY) LIMITED

	ADDRESS(ES) OF APPLICANT(S)
	BROADACRES HOME & GARDEN CENTRE, CRAIGAVON HOUSE, 1ST FLOOR, OFFICE 4B, RANDBURG, 2194, GAUTENG, SOUTH AFRICA

	TITLE OF INVENTION
54	CONVEYOR IDLER WITH LOCKING DEVICE

THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. THE EARLIEST PRIORITY CLAIM IS:

COUNTRY: NIL NUMBER: NIL DATE: NIL

~~THIS APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO.~~

21	01	

~~THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND IS BASED ON APPLICATION NO.~~

21	01	

THIS APPLICATION IS ACCOMPANIED BY:

- ☒ 1. A single copy of a provisional specification of 6 pages.
- ☒ 2. Drawings of 6 sheets.
- ☐ 3. Publication particulars and abstract (Form P.8 in duplicate).
- ☐ 4. A copy of Figure of the drawings (if any) for the abstract.
- ☒ 5. Assignment of invention.
- ☐ 6. Certified priority document.
- ☐ 7. Translation of the priority document.
- ☐ 8. Assignment of priority rights.
- ☐ 9. A copy of the Form P.2 and the specification of S.A. Patent Application No .
- ☒ 10. Declaration and power of attorney on Form P.3.
- ☐ 11 Request for ante-dating on Form P.4.
- ☐ 12. Request for classification on Form P.9.
- ☒ 13. Form P.2 in duplicate.
- ☐ 14. Other.

74 ADDRESS FOR SERVICE: SPOOR & FISHER, SANDTON

REGISTRAR OF PATENTS DESIGNS, TRADE MARKS AND COPYRIGHT
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REGISTRATEUR VAN PATENTE, MODELLE, HANDELSMERKE EN OUTEURSREG

Dated: 29 July 2003

SPOOR & FISHER
PATENT ATTORNEYS FOR THE APPLICANT(S)

REGISTRAR OF PATENTS

SPOOR & FISHER

FORM P.6

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978

PROVISIONAL SPECIFICATION

(Section 30(1) – Regulation 27)

OFFICIAL APPLICATION NO.		LODGING DATE	
21	01 2003/5822	22	29 JULY 2003

FULL NAMES OF APPLICANTS

71	ROLLERBRAKE (PROPRIETARY) LIMITED

FULL NAMES OF INVENTORS

72	BOGDANOVIC, BOGDAN

TITLE OF INVENTION

54	CONVEYOR IDLER WITH LOCKING DEVICE

FIELD OF THE INVENTION

This invention relates to an idler, roller, pulley or the like which can rotate in one direction only, and to a locking mechanism for such an idler, roller, pulley or the like.

SUMMARY OF THE INVENTION

According to the invention a device rotatable about a shaft includes an outer surface spaced from an inner surface, with the inner surface being part of the surface of the shaft or a surface non-rotatably fixed to the shaft, the outer surface having at least one recess with a ramp with a locking member located between the recess and the inner surface so that in use the device can rotate in one direction about the shaft but not in the opposite direction because the locking member becomes wedged between the ramp and the inner surface.

In the preferred form of the invention a plurality of recesses are provided each with its own ramp, and a locking member is provided between each recess and the inner surface, the locking members not being connected together.

The locking members may be balls or rollers.

Preferably the locking members are located within a locking housing and are thus connected together by the locking housing, the locking housing being located between the inner surface and the outer surface. The locking housing preferably has circumferentially spaced cages for the locking members with each locking member being rotatably located in its cage. Preferably the locking members are radially moveable within their cages.

Preferably the locking housing consists of two axially spaced end members with the cages being formed between the end members and between pairs of spaced axially extending walls located between the end members. The cages preferably project radially outwardly beyond the circumference of the end members. The locking housing may have a reinforcing web extending between the end members.

The locking housing may be made of a substantially rigid material. In one form of the invention the locking housing is made of nylon which may be nylon 66 or impact modified nylon.

The device rotatable about the shaft may be a drum of an idler, roller or pulley, and the shaft thus may be the shaft of the idler, roller or pulley. Preferably however the device is non-rotatably fixed to the drum. In this form of the invention the outer surface is preferably fixed to the drum via an end cap of the drum.

The scope of the invention also extends separately to the locking housing.

The scope of the invention extends separately to a conveyor belt installation including a conveyor belt supported on conveyor idlers described above so that the belt can move over the conveyor idlers in a forward direction but is prevented from moving over the conveyor idlers in a reverse direction.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a cross-sectional view of one end of a conveyor idler according to the invention;

Figure 2 is a perspective view of a locking housing;

Figure 3 is a plan view of the locking housing with its rollers displaced radially outwardly;

Figure 4 is the same view as figure 3 but with the rollers displaced radially inwardly;

Figure 5 is a perspective view from the inside of an end cap of the idler roller;

Figure 6 is a perspective view from the outside of the end cap;

Figure 7 is an end view of an end cap containing the locking housing in its unlocked position;

Figure 8 is the same view as figure 7 but with the locking housing in its locked position;

Figure 9 is a cross-sectional view on line II – II of figure 1 in an unlocked position; and

Figure 10 is the same view as figure 9 but in a locked position.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring firstly to figure 1, a conveyor idler 10 has a drum 12 with a pair of end caps 14 of which only one is shown. The end caps 14 are welded by welds 16 to the drum 12.

The drum 12 has an outer surface 18 over which a conveyor belt (not shown) can run. Each end cap 14 has a bearing housing 20 for a bearing 22 which enables a shaft 24 to rotate relative to the end cap 14 and hence relative to the drum 12. A labyrinth seal 26 protects the bearing 22 from the ingress of foreign matter.

A locking housing 28 is located between the end cap 14 and the shaft 24. It will be appreciated that a locking housing 28 can be located at only one end of the shaft 24 or at both ends of the shaft 24.

Referring now to figures 2 to 4, the locking housing 28 consists of two axially spaced members in the form of rings 32 with four pairs of spaced walls 34 extending between the rings 32 to define four cages 36 for rollers 38. The cages 36 project radially outwardly from the rings 32. A reinforcing web 39 extends between the rings 32. The rollers 38 can rotate within their cages 36 and can also move radially within their cages 36 as can be seen from figures 3 and 4.

Referring now to figures 5 and 6, the end cap 14 has a locking housing receiving zone 40. This zone 40 has four recesses 42 each with a ramp 44. Conveniently the end cap 14 is a pressing or a moulding. However the locking housing receiving zone 40 may be manufactured separately to the end cap 14 and subsequently secured to the end cap 14.

In figures 7 and 8 the locking housing 28 is shown in its unlocked and locked positions respectively in the end cap 14. How the locking housing 28 moves between these two positions is described with reference to figures 9 and 10. Referring in this regard firstly to figure 9, when the drum 12, and hence the end cap 14, rotate in the direction of arrow F, the locking housing 28 is located in the position shown with its rollers 38 at the back of their ramps 44 and out of engagement with the shaft 24. However when the drum 12, and hence the end cap 14, attempt to rotate in the direction of arrow R as shown in figure 10, the locking housing 28 moves relative to the end cap 14 to the position shown which is the locked position. In this locked position the rollers 38 have moved up their ramps 44 to become releasably wedged between their ramps 44 and the shaft 24 to lock the end caps 14 and hence the drum 12, to the shaft 24 thereby to prevent rotation of the drum 12 relative to the shaft 24. Once the direction of rotation is reversed back to that shown in figure 9, the rollers 38 move down their ramps 44 out of engagement with the shaft 24 enabling the end cap 14 and

hence the drum 12 to rotate relative to the shaft 24 again.

The locking housing 28 ensures that the circumferential spacing between rollers 38 does not vary, and therefore that all four rollers 38 will simultaneously engage the shaft 24 when an attempt is made to reverse the direction of rotation of the drum 12. This has the advantage that the locking torque is shared equally between the four rollers 38.

It will be appreciated that many modifications or variations of the invention are possible without departing from the spirit or scope of the invention.

DATED THIS 29TH DAY OF JULY 2003

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APPLICANT'S PATENT ATTORNEYS

• • • 2003 8822

Fig 1

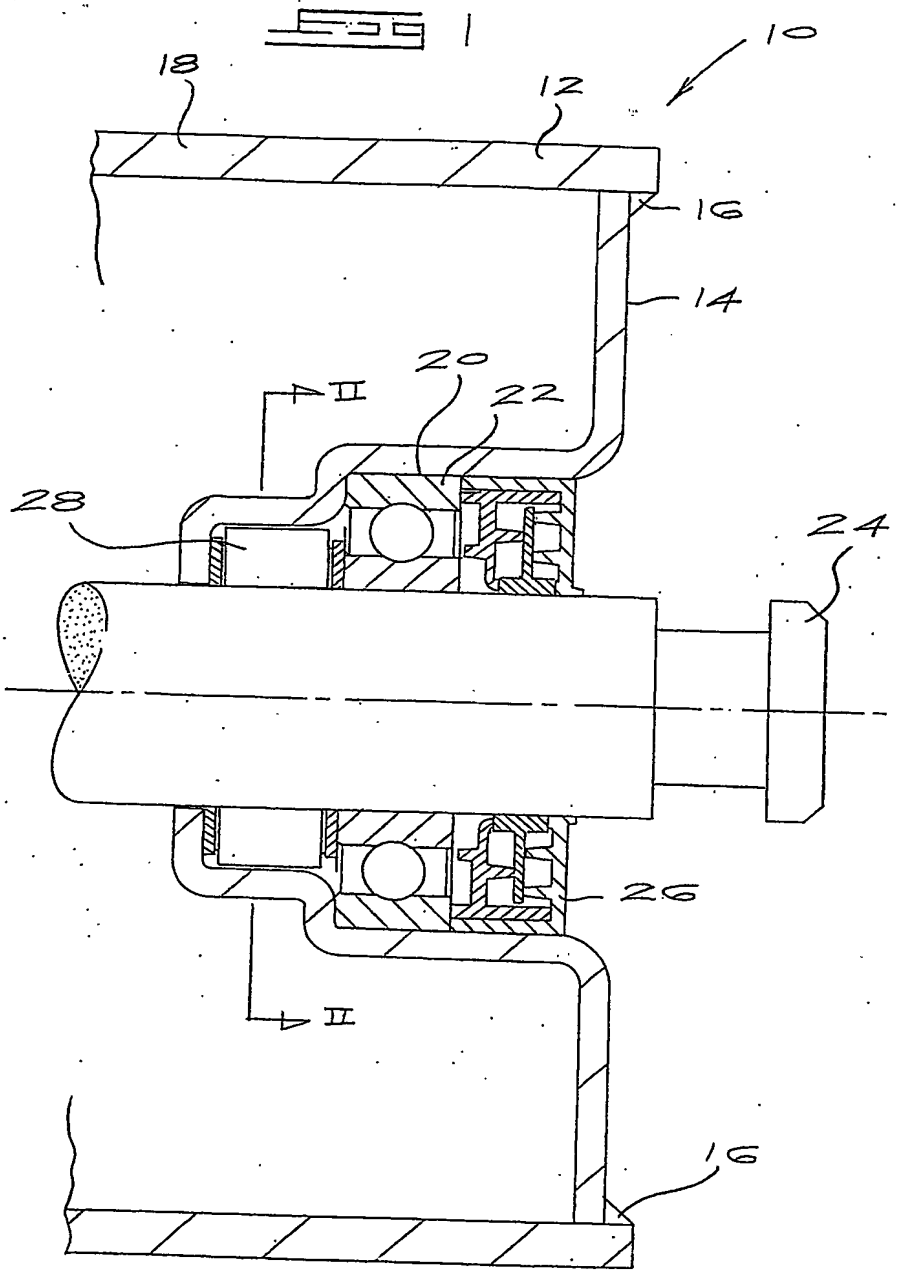

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FIG 2

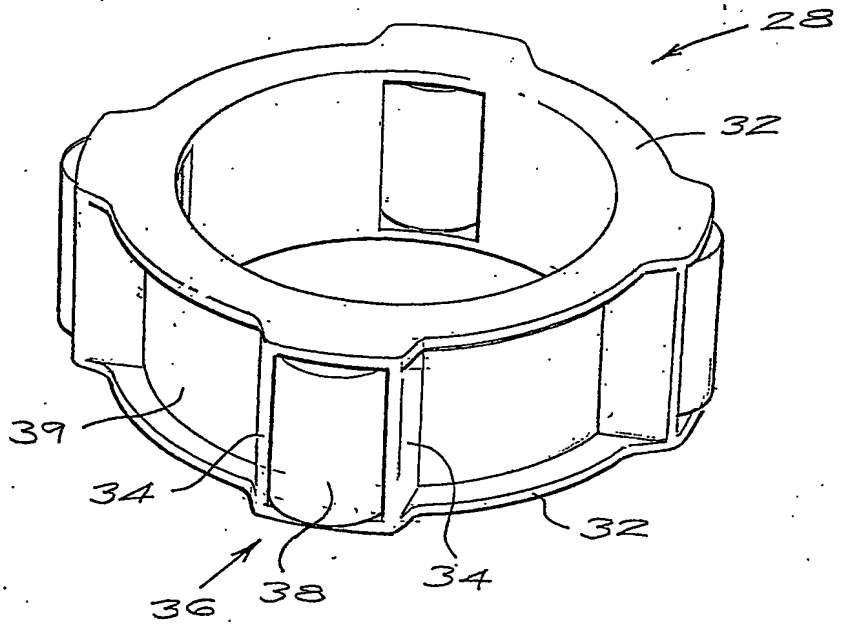

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FIG 3

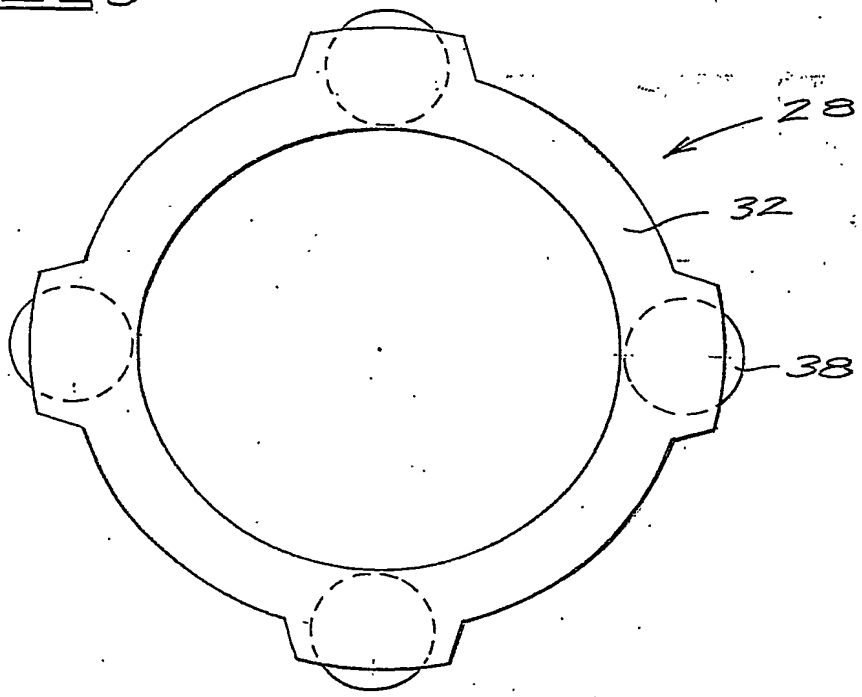

FIG 4

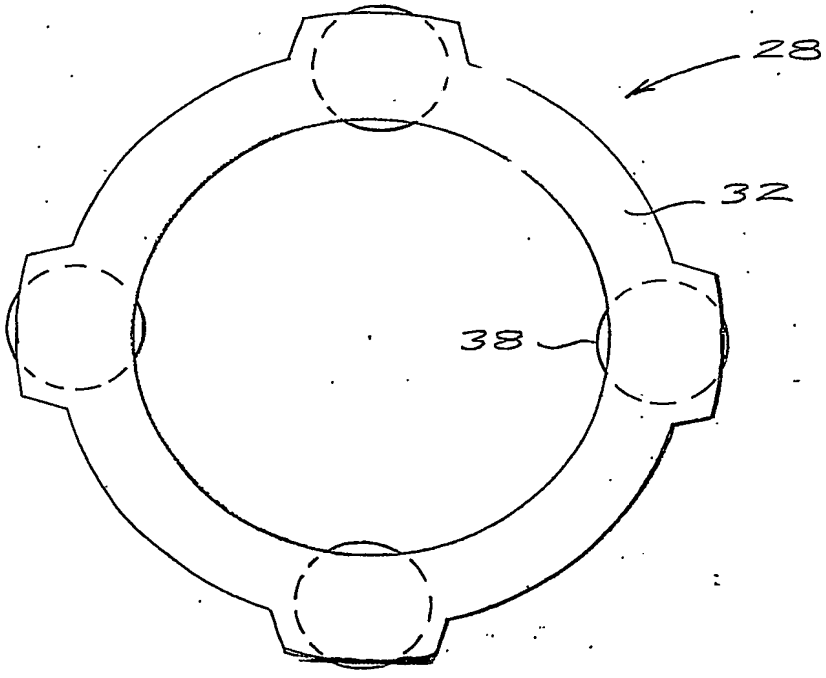

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FIG 5

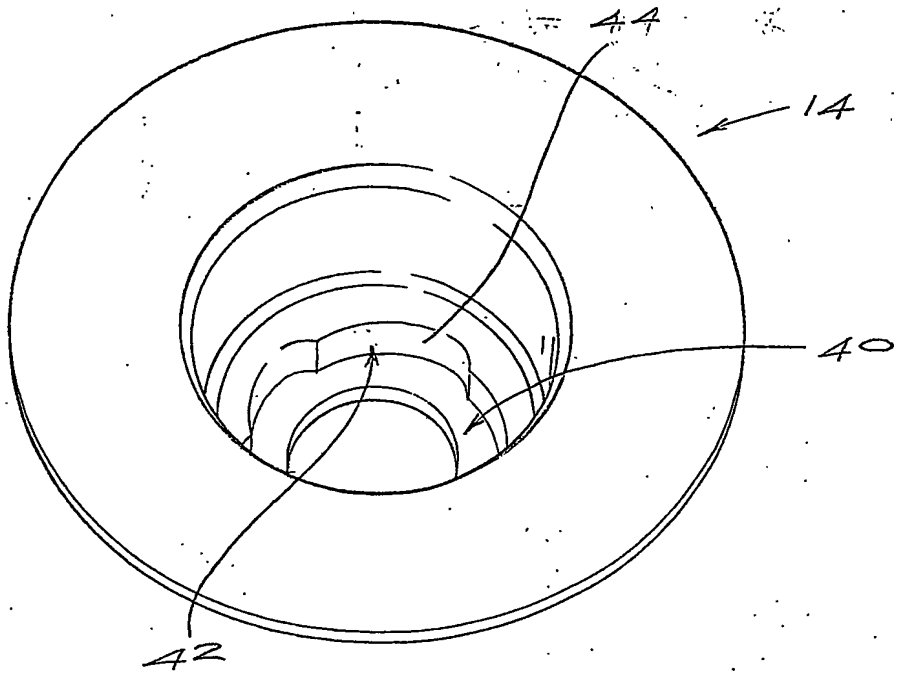

FIG 6

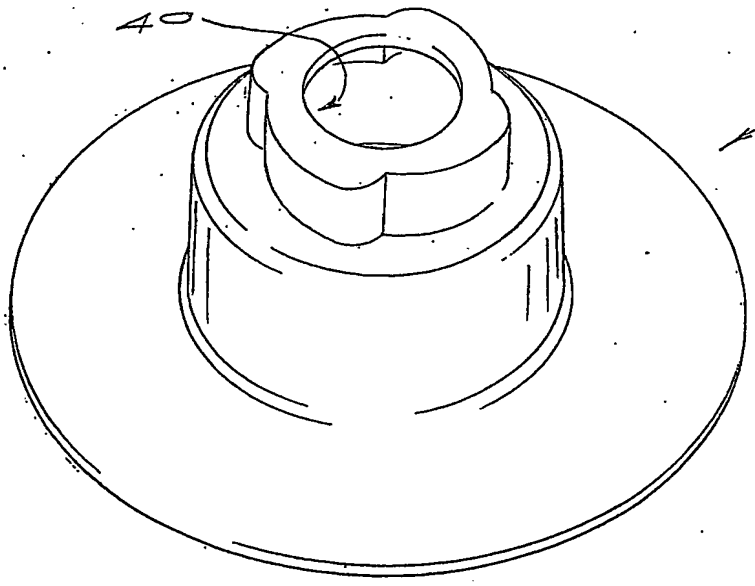

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FIG 7

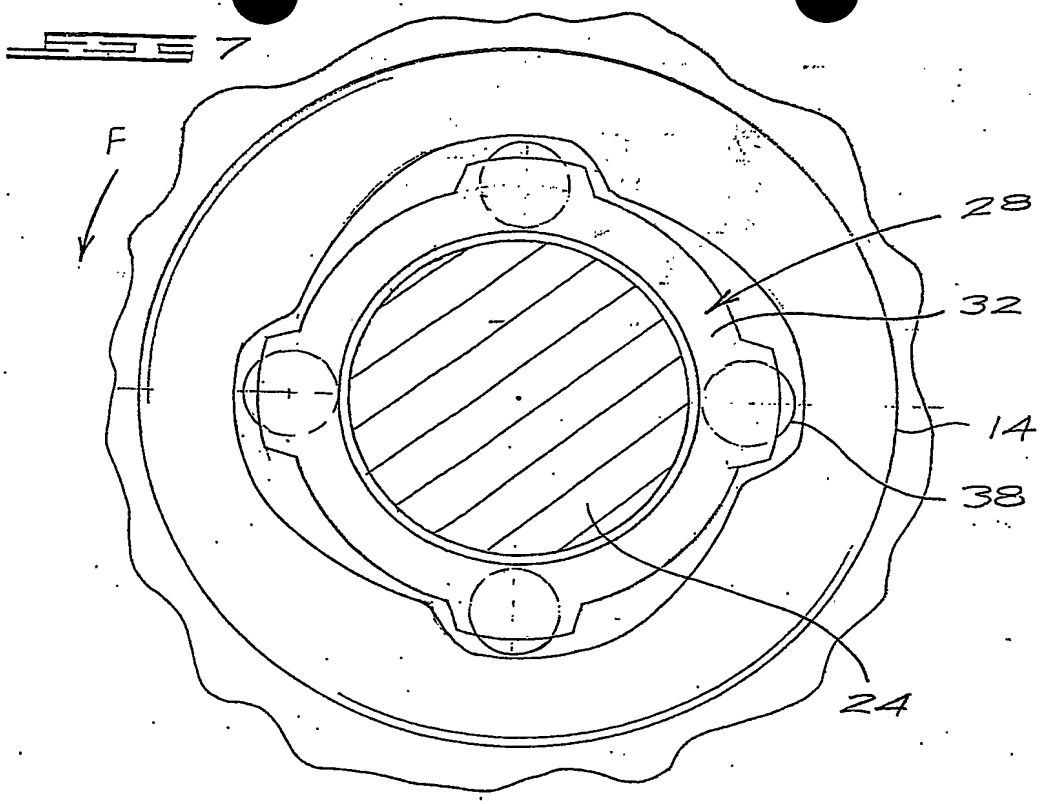

FIG 8

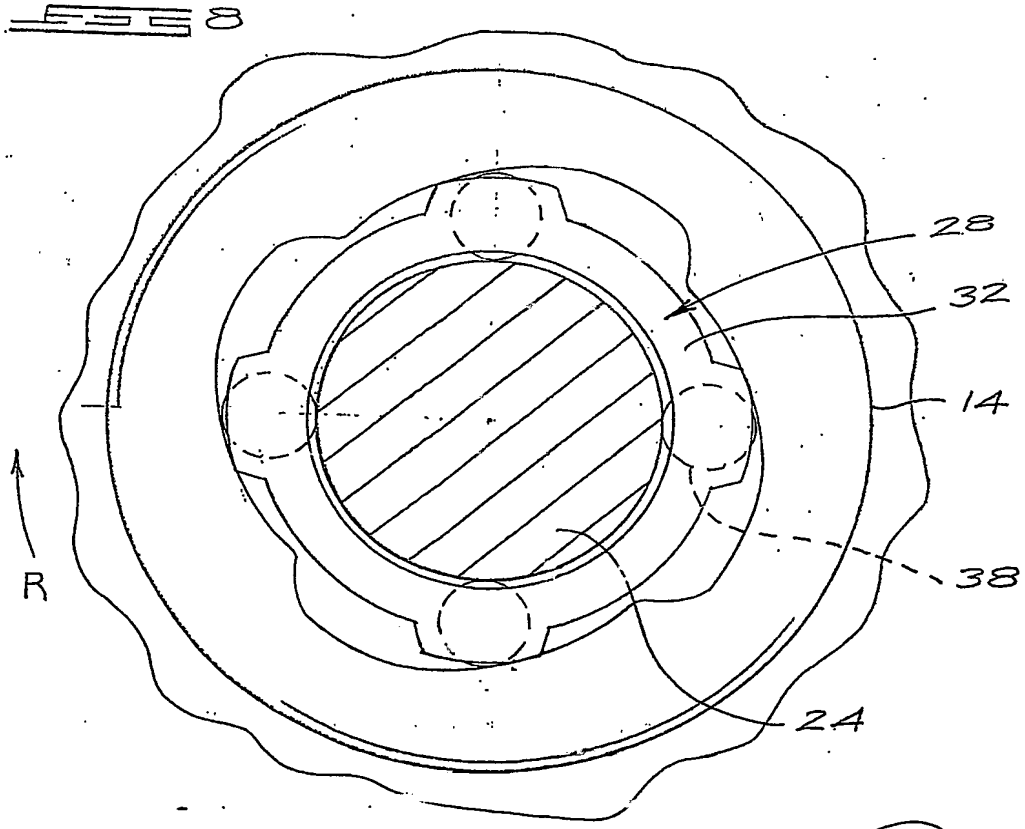

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FIG 9

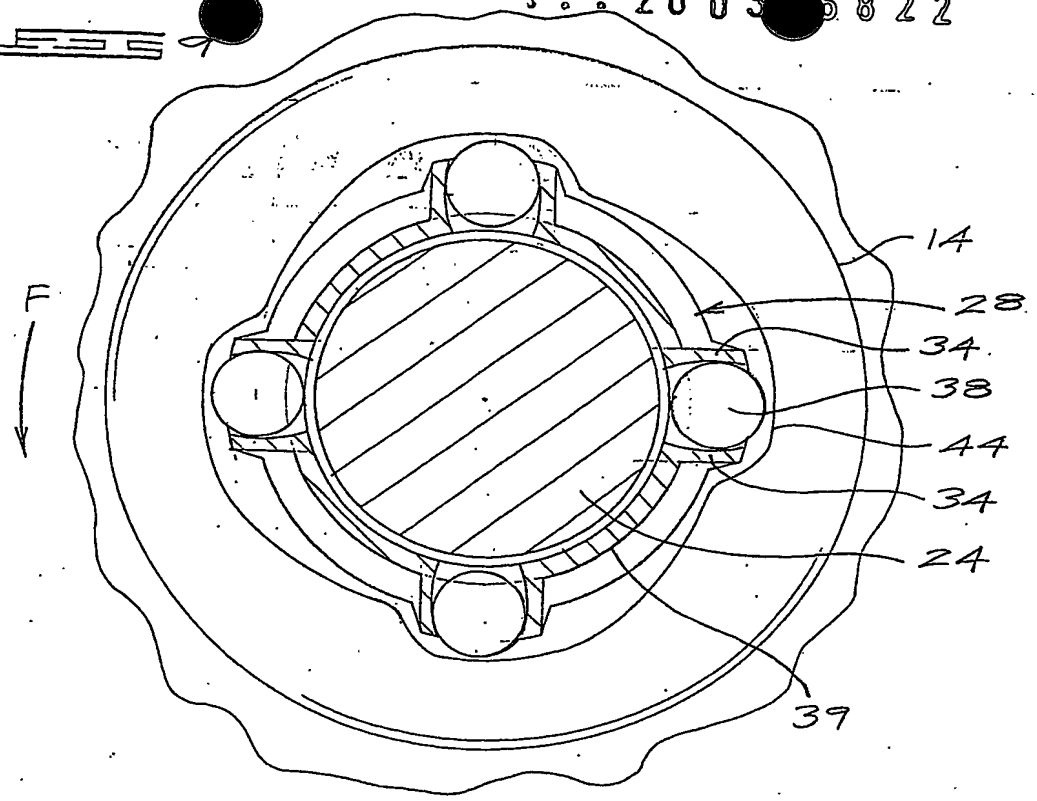
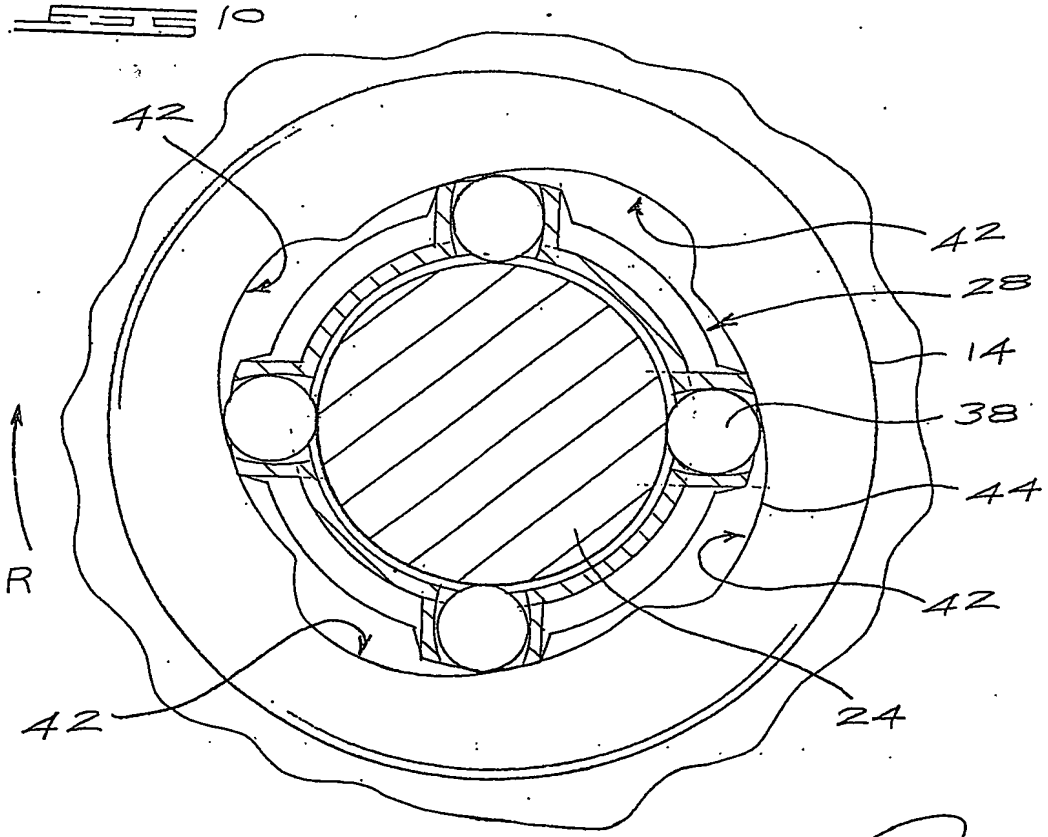


FIG 10



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